

PATENT

Attorney Docket No. Intel/16653

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (original): A method to control a distance between a chip die and a substrate, the method comprising:
coupling at least one spacer to the chip die or the substrate; and
bonding the chip die to the substrate, such that the spacer substantially defines the distance between the chip die and the substrate.
2. (original): A method as defined in claim 1, wherein the at least one spacer comprises at least one of a stud, a ball, a gold stud, a trapezoid, a leg, a post, a blob, a wedge, or a brace.
3. (original): A method as defined in claim 1, wherein an end of the at least one spacer is flattened.
4. (original): A method as defined in claim 1, wherein the at least one spacer has a core and a solder covering.
5. (original): A method as defined in claim 1, wherein the chip die comprises a flip chip die.
6. (original): A method as defined in claim 5, wherein bonding the flip chip die to the substrate optically couples an optical element of the flip

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chip to a waveguide mounted on the substrate.

7. (original): A method as defined in claim 1, wherein the substrate comprises at least one conductive pad coupled to its surface.

8. (original): A method as defined in claim 7, wherein the at least one conductive pad is a solder pad.

9. (original): A method as defined in claim 1, wherein bonding the die to the substrate comprises creating a solder joint between the at least one spacer and the substrate.

10. (original): A method as defined in claim 9, wherein the solder joint between the spacer and the substrate creates an electrical connection between the chip die and the substrate.

11. (original): A method as defined in claim 1, wherein bonding the chip to the substrate comprises thermocompression bonding the chip to the substrate.

12. (previously presented): A method to mount an optical flip chip die comprising:

coupling at least one spacer to the substrate or the flip chip die;

and

thermocompression bonding the at least one spacer to at least one conductive pad on the optical flip chip die or the substrate to establish a

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distance between the optical flip chip and an optical waveguide.

13. (original): A method as defined in claim 12, wherein the at least one spacer comprises at least one of a stud, a ball, a gold stud, a trapezoid, a leg, a post, a blob, a wedge, or a brace.

14. (original): A method as defined in claim 12, wherein the distance between the optical flip chip and the optical waveguide comprises a distance that substantially maximizes an optical coupling between the optical flip chip and the optical waveguide.

15. (original): A method as defined in claim 12, wherein the at least one spacer has a core and a solder covering.

16. (original): A method as defined in claim 12, wherein the core has a first melting point, the solder covering has a second melting point, and the first melting point is greater than the second melting point.

17. (original): A method as defined in claim 12, wherein the thermocompression bonding creates an electrical connection between the optical flip chip and the substrate.

Claims 18-24 (cancelled).